Care CEUs

Continuing Education for Nursing Home Administrators

Environmental Services

Introduction

Environmental services are essential to the day-to-day operation of a healthcare facility. Health care administrators should be familiar with environmental services recommendations and requirements to optimize results. This course provides insight into environmental services, while reviewing environmental services recommendations and requirements.

Section 1: Environmental Services

This section of the course provides insight into environmental services, as well as infectious diseases that can be prevented by effective environmental services procedures, such as: cleaning, decontamination, disinfection, and sterilization. The information found within this section of the course was derived from materials provided by the Centers for Disease Control and Prevention (CDC) unless, otherwise, specified (Centers for Disease Control and Prevention [CDC], 2020).

What are environmental services?

Environmental services may refer to a department or unit within a healthcare facility that is responsible for cleaning, decontamination, disinfection, sterilization, housekeeping, laundry, and other related duties.

Health care administrators should note the following: one of the main roles of environmental services is to prevent the transmission of infectious diseases through cleaning, decontamination, disinfection, and sterilization; environmental services can be essential to the prevention of health-care associated infections (note the term infectious diseases may refer to diseases caused by organisms, such as bacteria, viruses, fungi, or parasites; the term health-care associated infections may refer to infections that affect patients while they are receiving care in a healthcare facility).

What is cleaning?

Cleaning may refer to the removal of visible soil (e.g., organic and inorganic material) from objects and surfaces and normally is accomplished manually or mechanically using water with detergents or enzymatic products.

Health care administrators should note that thorough cleaning should be carried out before high-level disinfection and sterilization because inorganic and organic materials that remain on the surfaces of instruments interfere with the effectiveness of disinfection and sterilization.

What is decontamination?

Decontamination may refer to a process that removes pathogenic microorganisms from objects so they are safe to handle, use, or discard.

What is disinfection?

Disinfection may refer to a process that eliminates many or all pathogenic microorganisms, except bacterial spores, on inanimate objects.

Health care administrators should note the following: low-level disinfectants can kill most vegetative bacteria, some fungi, and some viruses in a practical period of time (e.g., ≤10 minutes); intermediate-level disinfectants can potentially kill mycobacteria, vegetative bacteria, most viruses, and most fungi, but do not necessarily kill bacterial spores; high-level disinfectants can potentially kill all microorganisms except large numbers of bacterial spores.

What is sterilization?

Sterilization may refer to a process that destroys or eliminates all forms of microbial life and is carried out in health care facilities by physical or chemical methods.

Health care administrators should note that steam under pressure, dry heat, EtO gas, hydrogen peroxide gas plasma, and liquid chemicals are the principle sterilizing agents used in health care facilities.

What are the factors that can affect the efficacy of both disinfection and sterilization?

Factors that can affect the efficacy of both disinfection and sterilization include: prior cleaning of the object; organic and inorganic load present; type and level of microbial contamination; concentration of and exposure time to the germicide; physical nature of the object (e.g., crevices, hinges, and lumens); presence of biofilms; temperature and pH

of the disinfection process; and, in some cases, relative humidity of the sterilization process (e.g., ethylene oxide).

What should healthcare administrators know about cleaning, decontamination, disinfection, and sterilization?

Health care administrators should possess insight into cleaning, decontamination, disinfection, and sterilization to ensure the effectiveness of environmental services. Specific information regarding cleaning, decontamination, disinfection, and sterilization may be found below.

- Thorough cleaning is required before high-level disinfection and sterilization because inorganic and organic materials that remain on the surfaces of instruments interfere with the effectiveness of these processes; if soiled materials dry or bake onto the instruments, the removal process becomes more difficult and the disinfection or sterilization process less effective or ineffective.
- Cleaning is done manually in areas without mechanical units (e.g., ultrasonic cleaners or washer-disinfectors) or for fragile or difficult-to-clean instruments (note: evidence indicates that manual and mechanical cleaning of endoscopes achieves approximately a significant reduction of contaminating organisms; thus, cleaning alone effectively reduces the number of microorganisms on contaminated equipment).
- With manual cleaning, the two essential components are friction and fluidics. Friction (e.g., rubbing/scrubbing the soiled area with a brush) is an old and dependable method. Fluidics (i.e., fluids under pressure) is used to remove soil and debris from internal channels after brushing and when the design does not allow passage of a brush through a channel.
- When a washer-disinfector is used, care should be taken in loading instruments: hinged instruments should be opened fully to allow adequate contact with the detergent solution; stacking of instruments in washers should be avoided; and instruments should be disassembled as much as possible.
- The most common types of mechanical or automatic cleaners are ultrasonic cleaners, washer-decontaminators, washer-disinfectors, and washer-sterilizers.

- Ultrasonic cleaning removes soil by cavitation and implosion in which waves of acoustic energy are propagated in aqueous solutions to disrupt the bonds that hold particulate matter to surfaces. Bacterial contamination can be present in used ultrasonic cleaning solutions (and other used detergent solutions) because these solutions generally do not make antibacterial label claims. Even though ultrasound alone does not significantly inactivate bacteria, sonication can act synergistically to increase the efficacy of a disinfectant. Users of ultrasonic cleaners should be aware that the cleaning fluid could result in endotoxin contamination of surgical instruments, which could cause severe inflammatory reactions.
- Washer-sterilizers are modified steam sterilizers that clean by filling the chamber with water and detergent through which steam passes to provide agitation. Instruments are subsequently rinsed and subjected to a short steam-sterilization cycle; some washer-sterilizers employ rotating spray arms for a wash cycle followed by a steam sterilization cycle at 285°F.
- Washer-decontaminators/disinfectors act like a dishwasher that uses a combination of water circulation and detergents to remove soil; these units sometimes have a cycle that subjects the instruments to a heat process (e.g., 93°C for 10 minutes).
- Washer-disinfectors are generally computer-controlled units for cleaning, disinfecting, and drying solid and hollow surgical and medical equipment.
- For instrument cleaning, a neutral or near-neutral pH detergent solution should be used because such solutions generally provide the best material compatibility profile and good soil removal.
- Enzymes, usually proteases, sometimes are added to neutral pH solutions to assist in removing organic material. Enzymes in these formulations attack proteins that make up a large portion of common soil (e.g., blood, pus).
- Cleaning solutions may contain lipases (enzymes active on fats) and amylases (enzymes active on starches).
- Enzymatic cleaners are not disinfectants, and proteinaceous enzymes can be inactivated by germicides. As with all chemicals, enzymes must be rinsed from the equipment or adverse reactions (e.g., fever) could result. Enzyme solutions should be used in accordance with manufacturer's instructions, which include proper

dilution of the enzymatic detergent and contact with equipment for the amount of time specified on the label.

- Detergent enzymes can result in asthma or other allergic effects in users.
- Neutral pH detergent solutions that contain enzymes are compatible with metals and other materials used in medical instruments and are the best choice for cleaning delicate medical instruments, especially flexible endoscopes.
- Alkaline-based cleaning agents should be used for processing medical devices because they efficiently dissolve protein and fat residues; however, they can be corrosive.
- Although the effectiveness of high-level disinfection and sterilization mandates effective cleaning, no “real-time” tests exist that can be employed in a clinical setting to verify cleaning.
- Validation of the cleaning processes in a laboratory-testing program is possible by microorganism detection, chemical detection for organic contaminants, radionuclide tagging, and chemical detection for specific ions.
- All instruments should be individually inspected and be visibly clean.
- Many disinfectants can be used alone or in combinations (e.g., hydrogen peroxide and peracetic acid) in the health care setting. These include alcohols, chlorine and chlorine compounds, formaldehyde, glutaraldehyde, ortho-phthalaldehyde, hydrogen peroxide, iodophors, peracetic acid, phenolics, and quaternary ammonium compounds; commercial formulations based on these chemicals are considered unique products and must be registered with the Environmental Protection Agency (EPA) or cleared by the United States Food and Drug Administration (FDA). In most instances, a given product is designed for a specific purpose and is to be used in a certain manner; users should read labels carefully to ensure the correct product is selected for the intended use and applied efficiently.
- Disinfectants are not interchangeable, and incorrect concentrations and inappropriate disinfectants can result in excessive costs.
- Alcohol, in the context of health care, refers to two water-soluble chemical compounds, ethyl alcohol and isopropyl alcohol, that have generally underrated germicidal characteristics; the FDA has not cleared any liquid chemical sterilant or

high-level disinfectant with alcohol as the main active ingredient; alcohols are rapidly bactericidal rather than bacteriostatic against vegetative forms of bacteria; they also are tuberculocidal, fungicidal, and virucidal but do not destroy bacterial spores; their cidal activity drops sharply when diluted below 50% concentration, and the optimum bactericidal concentration is 60% - 90% solutions in water (volume/volume).

- The antimicrobial action of alcohol is denaturation of proteins; this mechanism is supported by the observation that absolute ethyl alcohol, a dehydrating agent, is less bactericidal than mixtures of alcohol and water because proteins are denatured more quickly in the presence of water.

- Methyl alcohol (methanol) has the weakest bactericidal action of the alcohols and thus seldom is used in health care settings. Ethyl alcohol, at concentrations of 60% - 80%, is a potent virucidal agent inactivating all of the lipophilic viruses (e.g., herpes, vaccinia, and influenza virus) and many hydrophilic viruses (e.g., adenovirus, enterovirus, rhinovirus, and rotaviruses but not hepatitis A virus (HAV) or poliovirus). Isopropyl alcohol is not active against the nonlipid enteroviruses but is fully active against the lipid viruses.

- Alcohols are not recommended for sterilizing medical and surgical materials because they lack sporicidal action and they cannot penetrate protein-rich materials; research indicates that fatal postoperative wound infections with Clostridium occurred when alcohols were used to sterilize surgical instruments contaminated with bacterial spores; alcohols may be used to effectively disinfect oral and rectal thermometers, scissors, and stethoscopes; alcohol towelettes may be used to disinfect small surfaces such as rubber stoppers of multiple-dose medication vials or vaccine bottles; alcohol may be used to disinfect external surfaces of equipment (e.g., stethoscopes, ventilators, manual ventilation bags).

- Hypochlorites, the most widely used chlorine disinfectants, are available as liquid (e.g., sodium hypochlorite) or solid (e.g., calcium hypochlorite); one of the most prevalent chlorine products is an aqueous solution of 5.25% - 6.15% sodium hypochlorite, also known as household bleach; they have a broad spectrum of antimicrobial activity, do not leave toxic residues, are unaffected by water hardness, are inexpensive and fast acting, remove dried or fixed organisms and biofilms from surfaces, and have a low incidence of serious toxicity (note: sodium hypochlorite at the concentration used in household bleach can produce ocular irritation or oropharyngeal, esophageal, and gastric burns).

- Alternative compounds that release chlorine and are often used in health care settings include demand-release chlorine dioxide, sodium dichloroisocyanurate, and chloramine-T; the advantage of these compounds over the hypochlorites is that they retain chlorine longer and exert a more prolonged bactericidal effect.
- The exact mechanism by which free chlorine destroys microorganisms is not fully known. Inactivation by chlorine can result from a number of factors: oxidation of sulfhydryl enzymes and amino acids; ring chlorination of amino acids; loss of intracellular contents; decreased uptake of nutrients; inhibition of protein synthesis; decreased oxygen uptake; oxidation of respiratory components; decreased adenosine triphosphate production; breaks in DNA; and depressed DNA synthesis.
- Chlorine dioxide is considered to be bactericidal, fungicidal, sporicidal, tuberculocidal, and virucidal.
- Inorganic chlorine solution may be used for disinfecting tonometer heads and for spot-disinfection of countertops and floors. A 1:10 - 1:100 dilution of 5.25% - 6.15% sodium hypochlorite (i.e., household bleach) or an EPA-registered tuberculocidal disinfectant may be used for decontaminating blood spills; for small spills of blood (i.e., drops of blood) on noncritical surfaces, the area can be disinfected with a 1:100 dilution of 5.25% - 6.15% sodium hypochlorite or an EPA-registered tuberculocidal disinfectant; for large spills of blood, the surface should be cleaned before an EPA-registered disinfectant or a 1:10 solution of household bleach is applied.
- Formaldehyde may be used as a disinfectant; formaldehyde is sold and used principally as a water-based solution called formalin, which is 37% formaldehyde by weight; the aqueous solution is a bactericide, tuberculocide, fungicide, virucide, and sporicide (note: the Occupational Safety and Health Administration [OSHA] indicates that formaldehyde should be handled in the workplace as a potential carcinogen).
- Glutaraldehyde is considered to be a disinfectant and chemical sterilant.
- Glutaraldehyde is often used as a high-level disinfectant for medical equipment, such as: endoscopes, spirometry tubing, dialyzers, transducers, anesthesia and respiratory therapy equipment, and hemodialysis proportioning and dialysate delivery systems (note: glutaraldehyde exposure should be monitored to ensure a safe work environment).

- Hydrogen peroxide is often considered to be germicidal, bactericidal, virucidal, and sporicidal; hydrogen peroxide may also have fungicidal properties. Hydrogen peroxide works by producing destructive hydroxyl free radicals that can attack membrane lipids, DNA, and other essential cell components.
- Hydrogen peroxide is active against a wide range of microorganisms, including bacteria, yeasts, fungi, viruses, and spores.
- Commercially available 3% hydrogen peroxide is a stable and effective disinfectant when used on inanimate surfaces; it may be used in concentrations from 3% to 6% to disinfect ventilators, fabrics, and endoscopes; hydrogen peroxide may be used in the spot-disinfecting of fabrics in patients' rooms; hydrogen peroxide has been instilled into urinary drainage bags in an attempt to eliminate the bag as a source of bladder bacteriuria and environmental contamination.
- Ortho-phthalaldehyde is a high-level disinfectant.
- Phenolic germicides are EPA-registered as disinfectants for use on environmental surfaces (e.g., bedside tables, bed rails, and laboratory surfaces) and noncritical medical devices.
- Occupational diseases among cleaning personnel are associated with the use of several disinfectants (e.g., formaldehyde, glutaraldehyde, and chlorine); precautions (e.g., gloves and proper ventilation) should be used to minimize exposure; asthma and reactive airway disease can occur in sensitized persons exposed to any airborne chemical, including germicides; clinically important asthma can occur at levels below ceiling levels; the preferred method of control is elimination of the chemical (through engineering controls or substitution) or relocation of the employee.
- Sterilization destroys all microorganisms on the surface of an article or in a fluid to prevent disease transmission associated with the use of that item.
- Sterilization is measured as a probability of sterility for each item sterilized; this probability is commonly referred to as the sterility assurance level (SAL) of the product and is defined as the probability of a single viable microorganism occurring on a product after sterilization; SAL is normally expressed a 10^{-n}.
- Medical devices that have contact with sterile body tissues or fluids are considered critical items; these items should be sterile when used because any microbial contamination could result in disease transmission; such items include:

surgical instruments, biopsy forceps, and implanted medical devices; the recommended sterilization process is steam sterilization, because it has the largest margin of safety (note: steam sterilization is nontoxic and inexpensive).

- The basic principle of steam sterilization is to expose each item to direct steam contact at the required temperature and pressure for the specified time; there are four parameters of steam sterilization: steam, pressure, temperature, and time.
- The ideal steam for sterilization is dry saturated steam and entrained water (dryness fraction ≥97%).
- Pressure serves as a means to obtain the high temperatures necessary to quickly kill microorganisms. Specific temperatures must be obtained to ensure the microbicidal activity. The two common steam-sterilizing temperatures are 121°C (250°F) and 132°C (270°F). These temperatures (and other high temperatures) must be maintained for a minimal time to kill microorganisms. Recognized minimum exposure periods for sterilization of wrapped health care supplies are 30 minutes at 121°C (250°F) in a gravity displacement sterilizer or four minutes at 132°C (270°F) in a prevacuum sterilizer. At constant temperatures, sterilization times vary depending on the type of item (e.g., metal versus rubber, plastic, items with lumens), whether the item is wrapped or unwrapped, and the sterilizer type.
- Moist heat destroys microorganisms by the irreversible coagulation and denaturation of enzymes and structural proteins.
- Steam sterilization should be used whenever possible on all critical and semicritical items that are heat and moisture resistant (e.g., steam sterilizable respiratory therapy), even when not essential to prevent pathogen transmission; steam sterilizers should be used in health care facilities to decontaminate microbiological waste and sharps containers.
- Flash sterilization is a modification of conventional steam sterilization in which the flashed item is placed in an open tray or is placed in a specially designed, covered, rigid container to allow for rapid penetration of steam. Flash sterilization is not recommended as a routine sterilization method because of the lack of timely biological indicators to monitor performance, absence of protective packaging following sterilization, possibility for contamination of processed items during transportation, and the sterilization cycle parameters (i.e., time, temperature, pressure) are minimal. That being said, flash sterilization may be

used for processing cleaned patient-care items that cannot be packaged, sterilized, and stored before use.

- Individuals should perform most cleaning, disinfecting, and sterilizing of patient-care supplies in a central processing department in order to improve quality control; the goal of central processing should be the orderly processing of medical and surgical instruments to protect patients from infections while minimizing risks to health care employees and preserving the value of the items being reprocessed.

- Ensuring consistency of sterilization practices requires a comprehensive program that ensures operator competence and proper methods of cleaning and wrapping instruments, loading the sterilizer, operating the sterilizer, and monitoring of the entire process.

- Cleaning reduces the bioburden and removes foreign material (i.e., organic residue and inorganic salts) that interferes with the sterilization process by acting as a barrier to the sterilization agent; precleaning in patient-care areas may be needed on items that are heavily soiled with feces, sputum, blood, or other material; items sent to central processing without removing gross soil may be difficult to clean because of dried secretions and excretions; cleaning and decontamination should be done as soon as possible after items were used.

- Several types of mechanical cleaning machines (e.g., utensil washer-sanitizer, ultrasonic cleaner, washer-sterilizer, dishwasher, washer-disinfector) may facilitate cleaning and decontamination of most items; this equipment is often automated and may increase productivity, improve cleaning effectiveness, and decrease worker exposure to blood and body fluids; delicate and intricate objects and heat- or moisture-sensitive articles may require careful cleaning by hand; all used items sent to the central processing area should be considered contaminated (unless decontaminated in the area of origin), handled with gloves (forceps or tongs are sometimes needed to avoid exposure to sharps), and decontaminated by one of the aforementioned methods to render them safer to handle; items composed of more than one removable part should be disassembled; care should be taken to ensure that all parts are kept together, so that reassembly can be accomplished efficiently.

- Health care employees working in the decontamination area should wear household-cleaning-type rubber or plastic gloves when handling or cleaning

contaminated instruments and devices; face masks, eye protection such as goggles or full-length face shields, and appropriate gowns should be worn when exposure to blood and contaminated fluids may occur (e.g., when manually cleaning contaminated devices) (note: contaminated instruments are a source of microorganisms that could affect health care employees).

- When cleaning health care employees should not reach, with their gloved hands, into trays or containers that hold sharps; employees should use engineering controls (e.g., forceps) to retrieve these devices.

- Once items are cleaned, dried, and inspected, those requiring sterilization must be wrapped or placed in rigid containers and should be arranged in instrument trays/baskets. When arranging items in instrument trays/baskets hinged instruments should be opened; items with removable parts should be disassembled unless the device manufacturer or researchers provide specific instructions or test data to the contrary; complex instruments should be prepared and sterilized according to device manufacturer's instructions and test data; devices with concave surfaces should be positioned to facilitate drainage of water; heavy items should be positioned not to damage delicate items.

- All items to be sterilized should be arranged so all surfaces will be directly exposed to the sterilizing agent.

- Health care administrators should note the following basic principles for loading a sterilizer: allow for proper sterilant circulation; perforated trays should be placed so the tray is parallel to the shelf; nonperforated containers should be placed on their edge (e.g., basins); small items should be loosely placed in wire baskets; and peel packs should be placed on edge in perforated or mesh bottom racks or baskets.

- Following the sterilization process, medical and surgical devices must be handled using aseptic techniques in order to prevent contamination.

- Sterile supplies should be stored far enough from the floor (8 to 10 inches), the ceiling (5 inches unless near a sprinkler head [18 inches from sprinkler head]), and the outside walls (2 inches) to allow for adequate air circulation, ease of cleaning, and compliance with local fire codes (e.g., supplies must be at least 18 inches from sprinkler heads). Medical supplies should not be stored under sinks or in other locations where they can become wet. Sterile items that become wet are considered contaminated. Any package that falls or is dropped on the floor

must be inspected for damage to the packaging and contents (if the items are breakable). If the package is heat-sealed in impervious plastic and the seal is still intact, the package should be considered not contaminated. If undamaged, items packaged in plastic need not be reprocessed.

- The sterilization procedure should be monitored routinely by using a combination of mechanical, chemical, and biological indicators to evaluate the sterilizing conditions and indirectly the microbiologic status of the processed items. The mechanical monitors for steam sterilization should include the daily assessment of cycle time and temperature by examining the temperature record chart (or computer printout) and an assessment of pressure via the pressure gauge.

What types of infections can be prevented by effective cleaning, decontamination, disinfection, and sterilization?

Examples of the types of infections that can be prevented by effective cleaning, decontamination, disinfection, and sterilization include: Clostridioides difficile, methicillin-resistant Staphylococcus aureus (MRSA), and coronavirus disease 2019 (COVID-19). Specific information regarding Clostridioides difficile, methicillin-resistant Staphylococcus aureus (MRSA), and coronavirus disease 2019 (COVID-19) may be found below.

Clostridioides difficile

- Clostridioides difficile, also referred to as C. difficile or C. diff, is a bacterium that causes diarrhea and colitis (note: colitis may refer to inflammation of the colon). Additional information regarding C. diff may be found below. The information found below was derived from materials provided by the CDC (CDC, 2021).
- C. diff can be life-threatening.
- One in 11 people over age 65 diagnosed with a health care associated C. diff infection die within one month.
- Risk factors for C. diff include: being 65 or older; recent stay at a hospital or nursing home; a weakened immune system (e.g., individuals with HIV/AIDS, cancer, or organ transplant patients taking immunosuppressive drugs); previous infection with C. diff or known exposure to the bacterium.

- Symptoms of C. diff include the following: diarrhea, fever, stomach tenderness, stomach pain, loss of appetite, and nausea.
- Exposure to C. diff may lead to colonization. Colonization may refer to the presence of a microorganism on and/or in a host, with growth and multiplication of the organism, but without interaction between host and organism (e.g., the individual colonized will not appear sick).
- Colonization is more common than C. diff infection and does not require treatment. Once the body is colonized, individuals can remain colonized for several months.
- Individuals can spread C. diff to others while they are colonized.
- C. diff is more common in health care settings, such as hospitals and nursing homes. This is because many people colonized with C. diff are staying or being treated in those facilities.
- Complications associated with C. diff include: diarrhea, colitis, dehydration, toxic megacolon, sepsis, and death (note: toxic megacolon may refer to a condition characterized by swelling and inflammation of the deeper layers of the colon; sepsis may refer to the body's extreme response to an infection).
- When C. diff germs are outside of the body, they become spores; spores are an inactive form of the germ and have a protective coating allowing them to live for months or sometimes years on surfaces or in the soil; the germs become active again when these spores are swallowed and reach the intestines.
- C. diff germs are carried from person to person in feces.
- C. diff can be prevented. Methods that may be used to prevent C. diff include: hand hygiene, routine bathing (e.g., taking a daily bath or shower), and routine cleaning (note: hand hygiene may refer to the process of cleaning the hands in order to prevent contamination and/or infections).
- If individuals with C. diff (or caring for someone with C. diff) don't engage in hand hygiene with soap and water after using the bathroom, they can spread the germs to people and objects they touch.
- C. diff can also live on an individual's skin; individuals who touch an infected person's skin can pick up the germs on their hands; taking a shower and using

soap and water can reduce the C. diff on the skin and lessen the chance of it spreading.

- The regular cleaning of frequently touched surfaces (e.g., counter tops) can help prevent the transmission of C. diff in health care settings.
- If C. diff infection (CDI) occurs in a health care setting, health care administrators and other healthcare professionals should isolate and initiate contact precautions for suspected or confirmed CDI.
- Health care administrators should create health care-driven protocols to facilitate rapid isolation of patients with suspected or confirmed CDI.
- Patients with diarrhea should be isolated while evaluation for the cause is ongoing (e.g., patient remains isolated during a trial off laxatives).
- For suspected patients, health care administrators should ensure rapid evaluation by health care professionals and infection prevention.
- Health care professionals should place symptomatic patients on contact precautions, in a single-patient room with a dedicated toilet.
- If single-patient rooms are not available, health care administrators should room patients with confirmed CDI together.
- For patients with confirmed CDI, health care professionals should maintain contact precautions for at least 48 hours after diarrhea has resolved, or longer.
- Health care professionals should adhere to recommended hand hygiene practices.
- Health care professionals should use dedicated patient-care equipment (e.g., blood pressure cuffs, stethoscopes).
- Health care professionals should implement daily patient bathing or showering with soap and water.
- When transferring patients, health care professionals should notify receiving wards or facilities about the patient's CDI status so contact precautions are maintained at the patient's new location.

- To help prevent CDIs, health care administrators should create and assess daily and terminal cleaning protocols and checklists for patient-care areas and equipment.
- Health care administrators should ensure the daily cleaning of CDI patient rooms using a C. difficile sporicidal agent (e.g., EPA List K agent).
- Health care administrators should ensure the patient-care environment is cleaned and disinfected (including the immediate vicinity around a CDI patient and high touch surfaces) at least once a day, including toilets.
- Health care professionals should clean and disinfect all shared equipment prior to use with another patient (e.g., wheelchairs, gurneys).
- Health care administrators should ensure environmental services perform terminal cleaning after CDI patient transfer/discharge with a C. difficile sporicidal agent (e.g., EPA List K agent) (note: terminal cleaning may refer to the thorough cleaning/disinfection of all surfaces including floors and reusable equipment either within a healthcare facility and/or within an individual ward/department/ unit).
- Health care administrators should ensure the cleaning of additional areas that are contaminated during transient visits by patients with suspected or confirmed CDI (e.g., Radiology, Emergency Departments, Physical Therapy) with a C. difficile sporicidal agent (e.g., EPA List K agent).
- To help prevent CDIs, health care administrators should develop an infrastructure to support CDI prevention and environmental services.
- Health care administrators should incorporate processes to reduce CDIs into the facility health care-associated infection prevention program, including but not limited to the design, implementation, evaluation, and feedback of intervention results.
- Health care administrators should develop a multidisciplinary workgroup, consisting of physicians, nursing, environmental services, and antibiotic stewardship to identify and implement the following strategies: monitor facility CDI rates, and target units with highest incidence of CDI for evaluation and intervention; review hospital-onset CDI cases to help identify potential gaps and opportunities for improvement; focus on opportunities for improvement across each strategy (e.g., test indications, antibiotic appropriateness); utilize findings to

engage relevant care teams and staff in gap remediation and performance improvement as soon after the CDI case as possible; educate and train health care professionals on prevention practices for CDI.

- Health care administrators should routinely audit the following: adherence to hand hygiene; adherence to contact precautions; adequacy of room cleaning; the completeness of terminal cleaning.
- Health care administrators should provide CDI rates and other performance improvement measures to senior leadership, clinical providers, laboratory personnel, environmental services, and other stakeholders.
- Health care administrators should ensure the appropriate individuals and facility departments are notified about changes in the incidence (or frequency), complications (including recurrences), or severity of CDI.
- Health care administrators and managers should dedicate health care professionals to the care of patients with CDI only (i.e., without responsibility to care for non-CDI patients), who are typically cohorted on a single ward or unit, to minimize the risk of transmission to others.
- Health care professionals should work to restrict the use of antibiotics with the highest risk for CDI (e.g., fluoroquinolones, carbapenems, 3rd and 4th generation cephalosporins).
- Health care professionals should limit the use of other medications (e.g., proton pump inhibitors) that are hypothesized to increase risk for CDI.
- Health care professionals should evaluate and test asymptomatic patients at high risk for CDI to detect carriage.
- Health care professionals should isolate patients that test positive, but health care professionals should not treat in the absence of symptoms.
- Health care administrators should consider developing policies and procedures for the isolation of patients with diarrhea, until the diarrhea resolves, as a routine strategy.
- Health care administrators should ensure environmental services carry out additional disinfection of CDI patient rooms with no-touch technologies (e.g., UV light).

- Health care administrators should use environmental disinfection strategies (e.g., sporicidal agents [e.g., EPA List K agent]) for daily and terminal cleaning in all rooms on affected units.

Methicillin-resistant Staphylococcus aureus (MRSA)

Methicillin-resistant Staphylococcus aureus (MRSA) may refer to a bacterium that causes infections in different parts of the body. Additional information regarding MRSA may be found below. The information found below was derived from materials provided by the CDC (CDC, 2019).

- MRSA is a cause of staph infection that is difficult to treat because of resistance to some antibiotics.
- MRSA is usually spread by direct contact with an infected wound or from contaminated hands, usually those of a healthcare professional.
- MRSA can survive outside of the body on surfaces for hours, days, or even weeks; MRSA can spread to individuals who touch a contaminated surface.
- Individuals colonized by MRSA can spread the bacteria to others.
- Research indicates that about one in three (33%) people carry S. aureus bacteria in their nose, usually without any illness; about two in every 100 people carry MRSA; many individuals carry MRSA bacteria in their nose, most do not develop serious MRSA infections.
- The symptoms of a MRSA infection depend on the part of the body that is infected. For example, individuals with MRSA skin infections often can get swelling, warmth, redness, and pain in infected skin. In most cases it is hard to tell if an infection is due to MRSA or another type of bacteria without laboratory tests (note: some MRSA skin infections can have a fairly typical appearance and can be confused with a spider bite).
- Most S. aureus skin infections, including MRSA, appear as a bump or infected area on the skin that might be: red, swollen, painful, warm to the touch, full of pus or other drainage, and accompanied by a fever.
- In health care settings, MRSA may lead to bloodstream infections, pneumonia, surgical site infections, and death.

- MRSA can be prevented. Methods that may be used to prevent MRSA include: hand hygiene, routine bathing (e.g., taking a daily bath or shower), and routine cleaning/disinfecting.

- Hand hygiene is an important step to prevent MRSA; individuals should use soap and water to clean their hands if available. After wetting the hands and adding soap, individuals should scrub their hands for at least 20 seconds. If individuals cannot access soap and water, they should use an alcohol-based hand sanitizer that contains at least 60% alcohol to clean their hands. Individuals should apply the sanitizer to one hand, rub the hands together, trying to cover all surfaces of the hands and fingers until the hands are dry.

- Disinfectants effective against Staphylococcus aureus, or staph, are also effective against MRSA (note: the disinfectant's label should have a list of germs that the product can kill, along with an EPA registration number).

- Routine laundry procedures, detergents, and laundry additives will all help to make clothes, towels, and linens safe to wear or touch (note: hot water washing is not necessary to remove MRSA from laundry).

- Shared equipment that comes into direct skin contact should be cleaned after each use and allowed to dry. Equipment should be cleaned according to the equipment manufacturers' instructions to make sure the cleaner will not harm the item.

- Many items such as computer keyboards or handheld electronic devices may be difficult to clean or disinfect because they could be damaged if they become wet. If these items are touched by many individuals during the course of the day, a cleanable cover/skin (e.g., keyboard skin) could be used on the item to allow for cleaning while protecting the item.

- Large surfaces, such as floors and walls, are not associated with the spread of staph and MRSA. There is no evidence that spraying or fogging rooms or surfaces with disinfectants will prevent MRSA infections more effectively than the targeted approach of cleaning frequently touched surfaces and surfaces that have been exposed to open wounds.

- To help prevent MRSA transmission, health care administrators should ensure environmental services work to clean and disinfect surfaces and equipment that may be contaminated with pathogens, including those that are in close proximity

to a patient (e.g., bed rails, over bed tables) and frequently-touched surfaces in the patient care environment (e.g., door knobs, surfaces in and surrounding toilets in patients' rooms) on a more frequent schedule compared to that for minimal touch surfaces (e.g., horizontal surfaces in waiting rooms).

- To help prevent MRSA transmission, health care administrators should prioritize room cleaning of patients on Contact Precautions.
- Health care professionals should dedicate noncritical medical items to use on individual patients known to be infected or colonized with MRSA.
- To help prevent MRSA transmission, health care administrators should consider the following MRSA prevention strategies: use dedicated patient-care equipment (e.g., blood pressure cuffs, stethoscopes), and single use disposable items (e.g., single patient digital thermometer) whenever possible; if common use of equipment for multiple patients is unavoidable, clean and disinfect such equipment before use on another patient; provide regular competency-based training on use of personal protective equipment (PPE) and monitor adherence; active surveillance testing (screening) for MRSA (note: personal protective equipment (PPE) may refer to equipment designed to protect, shield, and minimize exposure to hazards that may cause serious injury, illness, and/or disease).
- To help prevent MRSA transmission, health care administrators should incorporate MRSA prevention strategies into health care-associated infection prevention programs.
- To help prevent MRSA transmission, health care administrators should develop a multidisciplinary workgroup, including nursing, environmental services, and infection prevention to identify and implement strategies and to follow results of interventions.
- To help prevent MRSA transmission, health care administrators should monitor facility MRSA counts, and target units with highest number of MRSA infection for evaluation and intervention; provide MRSA rates to senior leadership, clinical staff, and other stakeholders; notify appropriate individuals and facility departments about changes in the incidence (or frequency), and complications (including recurrences).

- To help prevent MRSA transmission, health care administrators should review individual MRSA episodes to assess modifiable risk factors including clinical management decisions and the use of infection control measures to identify gaps; educate and train all health care employees on prevention practices and core infection control practices such as hand hygiene, PPE use, Standard Precautions, Contact Precautions, and environmental cleaning and disinfection.
- To help prevent MRSA transmission, health care administrators should routinely audit and conduct competency-based assessments for core infection control practices; adherence to hand hygiene, Standard Precautions, and Contact Precautions; adequacy of room cleaning and environmental services.
- Provide administrative support, and both fiscal and human resources, to prevent and control MRSA transmission within a healthcare facility.
- Provide necessary leadership, funding, and day-to-day oversight to implement MRSA prevention strategies; involve the governing body and leadership of a healthcare facility.
- Evaluate health care system factors for their role in creating or perpetuating transmission of MRSA, including: staffing levels, education and training, availability of consumable and durable resources, communication processes, policies and procedures, and adherence to recommended infection control measures (e.g., hand hygiene and Standard or Contact Precautions).
- Develop, implement, and monitor action plans to correct system failures.
- Update health care professionals and other administrators on the progress and effectiveness of the intensified interventions; include information on changes in prevalence, rates of infection and colonization; results of assessments and corrective actions for system failures; degrees of adherence to recommended practices; and action plans to improve adherence to recommended infection control practices to prevent MRSA transmission.
- When needed, health care administrators should intensify the frequency of MRSA educational programs for healthcare professionals and environmental services staff.
- Intensify and reinforce training of environmental services staff who work in areas targeted for intensified MDRO control and monitor adherence to environmental cleaning policies (note: health care administrators should consider assigning

dedicated staff to targeted patient care areas to enhance consistency of proper environmental cleaning and disinfection services).

- Monitor (i.e., supervise and inspect) cleaning performance to ensure consistent cleaning and disinfection of surfaces in close proximity to the patient and those likely to be touched by the patient and HCP (e.g., bed rails, carts, bedside commodes, doorknobs, faucet handles).
- Obtain environmental cultures (e.g., surfaces, shared medical equipment) when there is epidemiologic evidence that an environmental source is associated with ongoing transmission of MRSA.
- Vacate units for environmental assessment and intensive cleaning when previous efforts to eliminate environmental reservoirs fail.
- Implement policies for patient admission and placement as needed to prevent transmission.

Coronavirus Disease 2019 (COVID-19)

Coronavirus disease 2019 (COVID-19) may refer to a respiratory illness that can spread from person to person, which is caused by a virus known as the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Additional information regarding COVID-19 may be found below. The information found below was derived from materials provided by the CDC (CDC, 2022).

- Coronaviruses are a large family of viruses that can cause illness in animals or humans; in humans, several coronaviruses are known to cause respiratory infections ranging from the common cold to more severe diseases such as Severe Acute Respiratory Syndrome (SARS); COVID-19 is a novel coronavirus that was first identified during an investigation into an outbreak in Wuhan, China.
- COVID-19 may spread between individuals who are in close contact with one another (within approximately six feet); COVID-19 may spread through respiratory droplets produced when an infected person coughs or sneezes.
- It is possible for an individual to obtain COVID-19 by touching a surface or an object that has become contaminated with the virus. For example, an individual may become infected with COVID-19 if he or she touches a surface contaminated with the virus and then touches his or her own mouth, nose, and/or eyes.

- Evidence suggests that coronaviruses (including the COVID-19 virus) may persist on surfaces for a few hours or up to several days; research suggests that the COVID-19 virus may live on surfaces for up to 28 days; the survivability of the COVID-19 virus on surfaces may vary under different conditions (e.g., type of surface; temperature or humidity of the environment in which the surface is in).
- The estimated incubation period for COVID-19 is between two and 14 days with a median of five days.
- The potential symptoms of COVID-19 include the following: fever, chills, cough, shortness of breath, aches and pain, fatigue, headaches, nasal congestion, runny nose, sore throat, nausea, vomiting, and diarrhea.
- COVID-19 can be prevented. Methods that may be used to prevent COVID-19 include: vaccination, hand hygiene, effective use of PPE, proper ventilation, and routine cleaning.
- SARS-CoV-2, the virus that causes COVID-19, is an enveloped virus, meaning that its genetic material is packed inside an outer layer (envelope) of proteins and lipids; the envelope contains structures (spike proteins) for attaching to human cells during infection; the envelope for SARS-CoV-2, as with other enveloped respiratory viruses, is labile and can degrade quickly upon contact with surfactants contained in cleaning agents and under environmental conditions (note: SARS-CoV-2 can survive on a variety of porous and non-porous surfaces; on porous surfaces, studies report inability to detect viable virus within minutes to hours; on non-porous surfaces, viable virus can be detected for days to weeks).
- Both cleaning (use of soap or detergent) and disinfection (use of a product or process designed to inactivate SARS-CoV-2) can reduce the risk of COVID-19 transmission. Evidence suggests cleaning reduces the amount of soil (e.g., dirt, microbes and other organic agents, and chemicals) on surfaces, but efficacy varies by the type of cleaner used, cleaning procedure, and how well the cleaning is performed; a 90 - 99.9% reduction of microbe levels is possible depending on the cleaning method and the surface being cleaned. In addition to physical removal of SARS-CoV-2 and other microbes, surface cleaning can be expected to degrade the virus; surfactants in cleaners can disrupt and damage the membrane of an enveloped virus like SARS-CoV-2.

- To substantially inactivate SARS-CoV-2 on surfaces, the surface must be treated with a disinfectant product (note: fogging or misting, are neither safe nor effective for inactivating the SARS-CoV-2 virus).
- Surface disinfection has been shown to be effective for preventing secondary transmission of SARS-CoV-2 between an infected person and other individuals.
- Routine cleaning performed effectively with soap or detergent, at least once per day, can substantially reduce virus levels on surfaces. When focused on high-touch surfaces, cleaning with soap or detergent should be enough to further reduce the relatively low transmission risk in situations when there is not a suspected or confirmed case of COVID-19 indoors; in situations when there is a suspected or confirmed case of COVID-19 indoors within the last 24 hours, the presence of infectious virus on surfaces is more likely and therefore high-touch surfaces should be disinfected.
- When an individual with suspected or confirmed COVID-19 has been indoors, the virus can remain suspended in the air for minutes to hours. The length of time the virus remains suspended and is infectious depends on numerous factors, including viral load in respiratory droplets or in small particles, disturbance of air and surfaces, ventilation, temperature, and humidity; wearing masks consistently and correctly can substantially reduce the amount of virus indoors, including the amount of virus that lands on surfaces.
- The CDC recommends a layered approach to reduce exposures to SARS-CoV-2; this approach includes using multiple mitigation strategies, including improvements to building ventilation, to reduce the spread of disease and lower the risk of exposure.
- SARS-CoV-2 viral particles spread between individuals more readily indoors than outdoors; indoors, the concentration of viral particles is often higher than outdoors; when indoors, ventilation mitigation strategies can help reduce viral particle concentration; the lower the concentration, the less likely viral particles can be inhaled into the lungs (potentially lowering the inhaled dose); contact eyes, nose, and mouth; or fall out of the air to accumulate on surfaces. Protective ventilation practices and interventions can reduce the airborne concentrations and reduce the overall viral exposure.
- Health care administrators should consider the following strategies to improve ventilation:

- Ensure ventilation systems operate properly and provide acceptable indoor air quality for the current occupancy level for each space;
- Rebalance or adjust HVAC systems to increase total airflow to occupied spaces when possible; turn off any demand-controlled ventilation (DCV) controls that reduce air supply based on occupancy or temperature during occupied hours;
- Open windows and doors, when weather conditions allow, to increase outdoor air flow (note: health care staff should not open windows and doors if doing so poses a safety or health risk to patients);
- Make sure air filters are properly sized and within their recommended service life;
- Inspect filter housing and racks to ensure appropriate filter fit and minimize air that flows around, instead of through, the filter;
- Ensure restroom exhaust fans are functional and operating at full capacity; inspect and maintain exhaust ventilation systems in areas, such as kitchens and cooking areas;
- Use portable high-efficiency particulate air (HEPA) fan/filtration systems to enhance air cleaning, especially in higher risk areas such as a nurse's office or areas frequently inhabited by individuals with a higher likelihood of having COVID-19 and/or an increased risk of getting COVID-19.

Section 1 Summary

Environmental services may refer to a department or unit within a healthcare facility that is responsible for cleaning, decontamination, disinfection, sterilization, housekeeping, laundry, and other related duties. Environmental services can be essential to the prevention of health-care associated infections. Health care administrators should possess insight into cleaning, decontamination, disinfection, and sterilization to ensure the effectiveness of environmental services.

Section 1 Key Concepts

- One of the main roles of environmental services is to prevent the transmission of infectious diseases through cleaning, decontamination, disinfection, and sterilization.
- Environmental services can be essential to the prevention of health-care associated infections.
- The transmission of Clostridioides difficile, methicillin-resistant Staphylococcus aureus (MRSA), and coronavirus disease 2019 (COVID-19) can be prevented by effective cleaning, decontamination, disinfection, and sterilization.

Section 1 Key Terms

Environmental services - a department or unit within a healthcare facility that is responsible for cleaning, decontamination, disinfection, sterilization, housekeeping, laundry, and other related duties

Infectious diseases - diseases caused by organisms, such as bacteria, viruses, fungi, or parasites

Health-care associated infections - infections that affect patients while they are receiving care in a healthcare facility

Cleaning - the removal of visible soil (e.g., organic and inorganic material) from objects and surfaces and normally is accomplished manually or mechanically using water with detergents or enzymatic products

Decontamination - a process that removes pathogenic microorganisms from objects so they are safe to handle, use, or discard

Disinfection - a process that eliminates many or all pathogenic microorganisms, except bacterial spores, on inanimate objects

Sterilization - a process that destroys or eliminates all forms of microbial life and is carried out in health-care facilities by physical or chemical methods

Alcohol (within the context of health care) - two water-soluble chemical compounds, ethyl alcohol and isopropyl alcohol, that have generally underrated germicidal characteristics

Flash sterilization - a modification of conventional steam sterilization in which the flashed item is placed in an open tray or is placed in a specially designed, covered, rigid container to allow for rapid penetration of steam

Clostridioides difficile (also referred to as C. difficile or C. diff) - a bacterium that causes diarrhea and colitis

Colitis - inflammation of the colon

Colonization - the presence of a microorganism on and/or in a host, with growth and multiplication of the organism, but without interaction between host and organism

Toxic megacolon - a condition characterized by swelling and inflammation of the deeper layers of the colon

Sepsis - the body's extreme response to an infection

Hand hygiene - the process of cleaning the hands in order to prevent contamination and/or infections

Terminal cleaning - the thorough cleaning/disinfection of all surfaces including floors and reusable equipment either within a healthcare facility and/or within an individual ward/ department/unit

Methicillin-resistant Staphylococcus aureus (MRSA) - a bacterium that causes infections in different parts of the body

Personal protective equipment (PPE) - equipment designed to protect, shield, and minimize exposure to hazards that may cause serious injury, illness, and/or disease

Coronavirus disease 2019 (COVID-19) - a respiratory illness that can spread from person to person, which is caused by a virus known as the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)

Section 1 Personal Reflection Question

Why are environmental services essential to the day-to-day operation of a healthcare facility?

Section 2: Environmental Cleaning Techniques and Recommendations

In addition to cleaning, decontamination, disinfection, and sterilization, health care administrators should possess insight into environmental cleaning techniques and recommendations to ensure the effectiveness of environmental services (note: environmental cleaning may refer to cleaning and disinfection [when needed, according to risk level] of environmental surfaces [e.g., bed rails, mattresses, call buttons, chairs] and surfaces of noncritical patient care equipment [e.g., IV poles, stethoscopes]). With that in mind, this section of the course will highlight environmental cleaning techniques and recommendations. The information found within this section of the course was derived from materials provided by the CDC unless, otherwise, specified (CDC, 2019).

Environmental Cleaning Techniques and Recommendations

- **Designate an environmental service manager** - an environmental service manager is essential to safe and effective environmental cleaning. Therefore, health care administrators/health care organizations should designate an environmental service manager (note: the environmental service manager should have a written job description/terms of reference, along with salary allocation, to cleaning program activities; the environmental service manager is essential regardless of whether environmental cleaning is managed internally or by an external company). The responsibilities of the environmental service manager should include the following: developing the health care facility-specific environmental cleaning policy and corresponding service level agreement or contract, when applicable; developing and maintaining a manual of standard operating procedures for all required cleaning tasks at the health care facility; ensuring that structured training activities are carried out for all new staff and on a recurring basis; ensuring that routine monitoring is implemented and results are used for program improvement; ensuring that cleaning supplies and equipment are available in required quantities and in good condition (i.e., preventing stock-outs); addressing staff concerns and patient questions about the cleaning program; communicating with external companies about required program elements, when needed.
- **Designate on-site supervisors** - on-site supervision allows cleaning staff to communicate any challenges or concerns about compliance (e.g., supply

shortage, safety concerns). All cleaning staff should know to whom they report and who they can contact if any issues arise during their work. Health care administrators should note that supervisor-cleaner ratios should allow routine performance observations and monitoring (e.g., on a weekly basis).

- **Develop and maintain environmental cleaning policies and procedures** - health care administrators and relevant staff should develop and maintain environmental cleaning policies and procedures to help ensure the effectiveness of environmental services. Environmental cleaning policies and procedures should include the following elements: defined lines of accountability and functional reporting lines and responsibilities for all implicated staff; cleaning schedules for every patient care area and noncritical patient care equipment, specifying the frequency, method, and staff responsible; contingency plans and required cleaning procedures for environmentally hardy organisms and for outbreak management; training requirements and performance standards for cleaning staff; monitoring methods, frequency, and staff responsible; a list of approved cleaning products, supplies, and equipment and any required specifications on their use; a list of necessary PPE and when hand hygiene action is recommended for staff and patient safety. Health care administrators should note the following: it is best practice to consult national or local governmental policies during the development of health care facility policies and procedures in order to ensure that governmental standards for health care environmental cleaning are incorporated into the documents (e.g., governmental bodies might have lists of environmental cleaning products that are approved for use in health care).

- **Ensure the training and education for cleaning staff** - training for cleaning staff should be based on national or facility environmental cleaning guidelines and policies. It should be mandatory, structured, targeted, and conducted before staff can work independently within the health care facility. Training and education for cleaning staff should include the following elements: general introduction to the principles of environmental cleaning; the key role cleaning staff play in keeping patients, staff, and visitors safe from infectious diseases; how cleaning staff can protect themselves from infectious diseases; detailed review of the specific environmental cleaning tasks for which they are responsible, including review of policies and procedures, checklists, and other job aids; when and how to safely prepare and use different detergents, disinfectants, and cleaning solutions; how to prepare, use, reprocess, and store cleaning supplies and equipment; participatory training methods, hands-on component with demonstration and

practice; easy-to-use visual reminders that show the cleaning procedures (i.e., without the need for a lot of reading); orientation to the health care facility layout and key areas for the cleaning program (e.g., environmental cleaning services areas); other health and safety aspects, as appropriate; the training program is developed according to the intended audience, in terms of education and literacy level; the training program is developed specifically for cleaning staff who could be responsible for cleaning procedures in specialized patient areas. Health care administrators should note the following: maintain training records, including dates, training content, and names of trainers and trainees; select appropriate, qualified trainers at a facility or district level; conduct periodic competency assessments and refresher trainings as needed (e.g., at least annually, before introduction of new environmental cleaning supplies or equipment); focus refresher trainings on gaps identified during competency assessments and routine monitoring activities.

- **Designate at least one environmental cleaning services area** - health care administrators should designate at least one environmental cleaning services area within their health care facility for preparation, storage, and reprocessing of reusable cleaning equipment and supplies. The designated environmental cleaning services area should: be well-ventilated and illuminated (lighting or window access); be labeled with a biohazard sign on the door; have an appropriate water supply (hot and cold water access, if feasible); have a utility sink/floor drain for safe disposal of used solutions; be designed so that, whenever possible, buckets can be emptied into utility sink/floor drains without lifting them or creating splashes; have a dedicated handwashing sink, used only for handwashing; have access to an eyewash station; have appropriate PPE available; have enough space to keep reprocessing (dirty areas) separate from storage areas for cleaned equipment; be easily accessible in relation to the areas it serves (i.e., easily accessible throughout the facility); be appropriately sized to the amount of materials, equipment, and chemicals stored in the room/area; have printed copies of the SDS for all environmental cleaning products, manufacturer's instructions, and job aids for preparation of cleaning and disinfectant solutions; never contain personal clothing or grooming supplies, food or beverages; there should be a separate area for cleaning staff to store these items; have safe chemical storage and access; have locks fitted to all doors to restrict access only to cleaning staff; be free from clutter; have washable surfaces (floors, walls, shelves). Health care administrators should note that the environmental cleaning services area should not be used for any other purposes.

- **Determine an annual budget** - an annual budget is essential to an effective environmental cleaning program. Therefore, health care administrators should determine an annual budget for environmental services. The essential elements of an annual budget for environmental services include the following elements: personnel (salary and benefits for cleaning staff, supervisors, and an overall program manager); staff training (at least pre-service and annual refresher); environmental cleaning supplies and equipment; equipment for program monitoring (e.g., fluorescent markers, UV-lights); administrative costs; production and printing costs for checklists, logs, and other job aids; infrastructure/services costs, such as supporting water and wastewater services, when applicable.
- **Follow recommendations for the reprocessing of reusable cleaning supplies and equipment** - environmental cleaning supplies and equipment may become contaminated during their use. Health care administrators should ensure the regular reprocessing of all reusable items (i.e., thoroughly clean, disinfect, and dry). Health care administrators should note the recommendations for the reprocessing of reusable cleaning supplies and equipment found below.
    - Send all reusable supplies and equipment (e.g., buckets, rubber gloves) for reprocessing directly after use in a transmission-based precaution area; when soiled with blood or body fluids.
    - Thoroughly clean, disinfect, and rinse equipment such as buckets and containers whenever solution is replaced and daily. Store them upside down to allow complete drying.
    - Launder mop heads, floor cloths, and soiled cleaning cloths at least daily (e.g., at the end of the day) and allow them to fully dry before storage and reuse.
    - Do not use chlorine-based disinfectants to disinfect microfiber cloths. Use laundry services with hot water (70 - 80°C x 10 min; 158 - 176°F) to reprocess cloths and mop heads, if they are available; a commercial dryer can be used for these items, if available (if not, these items are reprocessed as above).
    - Always launder mop heads and cleaning cloths separately from other soiled hospital textiles.

    - Reprocess all reusable supplies and equipment in a dedicated area that is not used for other purposes (i.e., reprocessing of cleaning equipment should never be conducted in handwashing sinks).
    - Reprocess (e.g., launder) all reusable supplies and equipment according to manufacturer's instructions.
    - All reusable supplies and equipment should be well maintained, clean, and in good repair. Regularly inspect and replace or repair all reusable equipment when needed. Develop a facility monitoring and maintenance schedule that clearly documents reusable supplies and equipment, frequency of inspection, and responsible staff.

- **Follow recommendations for cleaning staff personal attire/grooming** - cleaning staff should be adequately attired and groomed to safely and effectively carry out their duties. Health care administrators should note the following recommendations for cleaning staff personal attire/grooming: keep sleeves at or above the elbow to not interfere with glove use or hand hygiene; wear rubber-soled closed toe shoes or boots (i.e., not sandals), to prevent accidental injury (e.g., slips and falls) and exposure to cleaning chemicals, dirt, or bacteria; remove wristwatches and hand jewelry before starting cleaning tasks - these items can tear gloves and can also pick up microorganisms; keep fingernails short and free of nail varnish to prevent tearing of gloves and picking up dirt and bacteria.
- **Obtain required personal protective equipment (PPE)** - before engaging in environmental cleaning procedures individuals should obtain required PPE (e.g., gloves). Health care administrators should note that PPE may refer to equipment designed to protect, shield, and minimize exposure to hazards that may cause serious injury, illness, and/or disease. Health care administrators should also note the following PPE recommendations: when engaged in terminal cleaning individuals should wear reusable rubber gloves; when cleaning up blood and body fluid spills and high contamination risk areas individuals should wear a gown and/or plastic apron, reusable rubber gloves, and a face mask with either goggles or face shield; when preparing disinfectant products and solutions individuals should wear chemical-resistant gloves (e.g., nitrile), gown and/or apron, and face mask with either goggles or face shield.
- **Use cleaning logs** - cleaning logs may refer to job aids that can help guide the daily workflow for cleaning staff and serve as a cleaning record. Cleaning logs

should specify the location, cleaning session (e.g., routine cleaning, terminal cleaning), date, and name/signature of cleaning staff. Health care administrators should note the following: logs should be available in central locations or where the cleaning task occurs so that supervisory staff can manage them on a daily basis, along with staff responsible for periodic monitoring activities; logs should indicate required periodic or scheduled cleaning tasks (e.g., weekly, monthly).

- **Conduct a visual preliminary site assessment** - before engaging in environmental cleaning procedures, individuals should conduct a visual preliminary site assessment to determine if: patient status could pose a challenge to safe cleaning; there is any need for additional PPE or supplies (e.g., if there are any spills of blood/body fluids or if the patient is on transmission-based precautions); there are any obstacles (e.g., clutter) or issues that could pose a challenge to safe cleaning; there is any damaged or broken furniture or surfaces to be reported to supervisor/management. Individuals should proceed with an environmental cleaning procedure after the visual preliminary site assessment is complete.

- **Proceed from cleaner to dirtier** - when engaging in environmental cleaning procedures individuals should proceed from cleaner to dirtier. For example, individuals should clean low-touch surfaces before high-touch surfaces; individuals should clean patient areas (e.g., patient zones) before patient toilets (note: low-touch surfaces may refer to surfaces that are minimally touched by health care workers and patients [e.g., walls, ceilings, floors]; high-touch surfaces may refer to surfaces, often in patient care areas, that are frequently touched by health care workers and patients [e.g., bedrails, IV pole, door knobs, medication carts]; patient zone may refer to the patient and his or her immediate surroundings, including all surfaces that are temporarily and exclusively designated for that patient). Health care administrators should note the following: within a specified patient room, terminal cleaning should start with shared equipment and common surfaces, then proceed to surfaces and items touched during patient care that are outside of the patient zone, and finally to surfaces and items directly touched by the patient inside the patient zone (i.e., high-touch surfaces outside the patient zone should be cleaned before the high-touch surfaces inside the patient zone); individuals should clean general patient areas not under transmission-based precautions before those areas are under transmission-based precautions.

- **Proceed from high to low** - when engaging in environmental cleaning procedures, individuals should proceed from high to low to prevent dirt and microorganisms from dripping or falling and contaminating already cleaned areas (e.g., cleaning bed rails before bed leg; cleaning environmental surfaces before cleaning floors).
- **Utilize the recommended surface cleaning process** - when cleaning specific surfaces, individuals should use the recommended surface cleaning process found below.

  Surface Cleaning Process

  1. Thoroughly wet (soak) a fresh cleaning cloth in the environmental cleaning solution.
  2. Fold the cleaning cloth in half until it is about the size of a hand (note: folding the cleaning cloth will ensure that one can use all of the surface area efficiently).
  3. Wipe surfaces using the general strategies as above (e.g., clean to dirty; high to low), making sure to use mechanical action (for cleaning steps) and making sure the surface is thoroughly wetted to allow required contact time (for disinfection steps).
  4. Regularly rotate and unfold the cleaning cloth to use all of the sides.
  5. When all of the sides of the cloth are used or when it is no longer saturated with solution, dispose of the cleaning cloth or store it for reprocessing.
  6. Repeat process from Step 1

- **Adhere to scheduled cleaning** - scheduled cleaning should occur concurrently with routine or terminal cleaning and should reduce dust and soiling on low touch items or surfaces. Individuals should perform scheduled cleaning on items or surfaces that are not at risk for soiling under normal circumstances, using neutral detergent and water (note: if items and surfaces are visibly soiled with blood or body fluids, individuals should clean and disinfect these items as soon as possible).
- **Follow patient toilet recommendations** - toilets in patient care areas can be private (within a private patient room) or shared (among patients and visitors). Patient toilets have high patient exposure (i.e., high-touch surfaces) and are

frequently contaminated. Therefore, they pose a higher risk of pathogen transmission than in general patient areas and should be cleaned and disinfected as recommended. Health care administrators should note the following patient toilet recommendations: private toilets should be cleaned and disinfected at least once daily (e.g., per 24-hour period), after routine cleaning of patient care areas; public or shared toilets (e.g., patients, visitors, family members) should be cleaned and disinfected at least twice daily.

- **Follow patient floor recommendations** - floors generally have low patient exposure (i.e., are low-touch surfaces) and pose a low risk for pathogen transmission. Therefore, under normal circumstances they should be cleaned daily, but the use of a disinfectant is not necessary. Health care administrators should note the following patient floor recommendation: floors in general inpatient and outpatient areas should always be cleaned last after other environmental surfaces at least once daily (e.g., per 24-hour period) or as often as specified in the specific patient care area.

- **Use a two- or three-bucket system for mopping** - the CDC recommends using a two- or three-bucket system for mopping. In a three-bucket system, which should be used for disinfection, one bucket should contain the detergent or cleaning solution, one bucket should contain rinse water and one bucket should contain the disinfectant or disinfectant solution (note: the rinse water bucket allows the mop to be rinsed and wrung out before it is re-dipped into the prepared solution, which extends the life of the solution (i.e., fewer changes are required, saving both time and material costs).

- **Follow the general mopping process** - when mopping floors, individuals should follow the general mopping process found below unless otherwise specified by a health care organization's policies and procedures.

  <u>General Mopping Process</u>

  1. Immerse the mop or floor cloth in the bucket with an environmental cleaning solution and wring out.

  2. Mop in a figure-eight pattern with overlapping strokes, turning the mop head regularly (e.g., every five to six strokes).

  3. After cleaning a small area (e.g., 3m x 3m), immerse the mop or floor cloth in the bucket with rinse water and wring out.

4. Repeat the process from Step 1.

- **Immediately attend to body fluid spills** - individuals should immediately attend to body fluid spills to prevent accidents and exposure incidents. To effectively attend to body fluid spills, individuals should follow the process found below.

  Process for Cleaning of Spills of Blood or Body Fluids

  1. Obtain and don appropriate PPE.
  2. Confine the spill and wipe it up immediately with absorbent (paper) towels, cloths, or absorbent granules (if available) that are spread over the spill to solidify the blood or body fluid (all should then be disposed as infectious waste).
  3. Clean thoroughly, using neutral detergent and warm water solution.
  4. Disinfect by using a facility-approved intermediate-level disinfectant (note: typically, chlorine-based disinfectants at 500-5000ppm free chlorine or 1:10 dilution of 5% chlorine-bleach, are adequate for disinfecting spills).
  5. Take care to allow the disinfectant to remain wet on the surface for the required contact time (e.g., 10 minutes), and then rinse the area with clean water to remove the disinfectant residue (if required).
  6. Immediately send all reusable supplies and equipment (e.g., cleaning cloths, mops) for reprocessing (i.e., cleaning and disinfection) after the spill is cleaned up.

- **Follow recommendations for medication preparation areas** - departments or areas where medication is prepared (e.g., pharmacy or in clinical areas) often service vulnerable patients in high-risk and critical care areas, in addition to other patient populations, and thus, should be regularly cleaned/disinfected. Health care administrators should note the following: the staff who work in the medication preparation area might be responsible for cleaning and disinfecting it, instead of the environmental cleaning staff; health care administrators should develop detailed standard operating procedures and checklists for each facility to identify roles and responsibilities for environmental cleaning in these areas. Health care administrators should also note the following medication preparation area recommendations: countertops and portable carts used to prepare or

transport medications should be cleaned/disinfected before and after use; all high-touch surfaces (e.g., light switches, countertops, handwashing sinks, cupboard doors, and floors) should be cleaned/disinfected at least once every 24 hours; low-touch surfaces, such as the tops of shelves, walls, vents should be cleaned/disinfected on a scheduled basis.

- **Follow recommendations for sluice room** - each major patient care area should be equipped with a designated sluice room to reprocess soiled noncritical patient care equipment (e.g., commode chairs, bedpans) (note: a sluice room may refer to a dedicated room or area, separated into dirty and clean areas, where noncritical patient care equipment is reprocessed; access to a sluice room should be restricted to cleaning staff and authorized personnel). Alternatively, there may be central depots where these procedures are performed. Health care administrators should also note the following sluice room recommendations: sluice rooms should be as close as possible to the patient care areas that they serve and should have an organized workflow from soiled (dirty) to clean; the soiled area (used for reprocessing equipment) should be adequately sized and have: a door that is kept closed at all times and ideally has hands-free operation, a work counter and sluice/utility sink with a hot and cold faucet, a dedicated handwashing sink, space for washers/disinfectors (if resources allow), and PPE available to protect staff during cleaning and disinfecting procedure; the clean area (used for storing reprocessed equipment) should: be distinctly separate from (by workflow) soiled areas to prevent confusion regarding processing status; have shelves that are smooth, non-porous and easy to clean; be protected from water and soil, dirt, and dust; be as close as possible to patient areas and easily available to staff.

- **Assess environmental cleaning procedures** - assessments of environmental cleaning procedures should be carried out to ensure their effectiveness. Specific methods that may be used to assess environmental cleaning procedures may be found below.

    - **Performance observations** - performance observations may refer to a method of assessing environmental cleaning procedures by an observer (e.g., cleaning supervisors) using standardized performance structured observations and checklists that are specific to individual patient care areas. The goal of a performance observation is to rate the effectiveness of cleaning staff and adherence to the relevant standard operating procedure

(e.g., identifying the number of steps performed correctly). Advantages of performance observations include the following: they can be used for large areas; they are, typically, easy to implement; benchmarking is possible; they are, typically, simple and inexpensive; they allow immediate and direct feedback to individual staff; they often encourage cleaning staff engagement and input; they identify gaps for staff training/job aid improvements. Disadvantages of performance observations include the following: they can be subjective; they can be labor-intensive; they do not assess or correlate to bioburden (note: bioburden may refer to the number of bacteria living on a surface that has not been sterilized).

- **Visual assessment** - a visual assessment may refer to an assessment that checks the cleanliness of an item or surface after the item/surface was cleaned (e.g., using a gloved hand, wipe surfaces to inspect for dust). Advantages of visual assessments include the following: they can be applied to the entire facility or specific area; they are easy to implement; benchmarking is possible; they are inexpensive; they allow immediate and direct feedback to individual staff. Disadvantages of visual assessments include the following: there could be a delay in feedback; they can be subjective; they do not assess or correlate to bioburden.

- **Fluorescent marker assessment** - a fluorescent marker assessment may refer to an assessment that uses a fluorescent marker (e.g., fluorescent material) to mark predetermined items and surfaces before cleaning (note: after cleaning, a trained observer uses a detecting agent [e.g., ultraviolet light, enzymatic detector] to determine if any tracing agent is left; the observer counts the items that still show tracing agent and gives a score based on how many were cleaned completely, partially, or not at all). Advantages of fluorescent marker assessments include the following: they are often quick; they provide immediate feedback on performance; minimal training required to perform the assessment; they are objective; benchmarking is possible. Disadvantages of fluorescent marker assessments include the following: they are labor-intensive as surfaces should be marked before cleaning and checked after cleaning is completed; they are time-intensive; there is a need to vary frequency and objects to prevent the monitoring system from becoming known; they do not assess or correlate to bioburden.

- **ATP bioluminescence assessment** - ATP bioluminescence assessment may refer to an assessment characterized by the use of ATP to indicate the presence of organic material (microbial or biologic) on an object or surface. The ATP bioluminescence assessment should be used to test objects and/or surfaces before and after cleaning to determine the effectiveness of a cleaning procedure; a numeric score can be generated based on the proportion of marked surfaces/objects that were under the pre-determined threshold. Advantages of the ATP bioluminescence assessment include the following: it is, typically, fast; it can provide immediate feedback; it requires minimal training to perform; it is objective. Disadvantages of the ATP bioluminescence assessment include the following: it is expensive; it has low sensitivity and specificity; it lacks a standardized threshold or benchmark for determining the level or status of cleanliness (i.e., “safe” post-cleaning ATL levels) for specific surfaces or patient care areas; variable benchmarks; the technology is constantly changing; interference of cleaning products, supplies and in some cases surfaces, which can both reduce or enhance ATP levels (e.g., bleach, microfiber,
stainless steel).

- **Environmental culture assessment** - environmental culture assessment may refer to an assessment characterized by the process of taking cultures after an item is cleaned (note: an environmental culture assessment is the only direct measurement of levels of microbial contamination after cleaning). Advantages of an environmental culture assessment include the following: it is objective; it has a high sensitivity and specificity; it provides direct indication of the presence of specific pathogens (direct swab cultures); it may be useful for identifying source of outbreaks and/or environmental reservoirs. Disadvantages of an environmental culture assessment include the following: it is not recommended for routine use; it can be expensive; prolonged time for results (>48hrs); it requires access to laboratory resources and trained personnel for interpreting results; there is a lack of defined threshold or benchmark for determining the level or status of cleanliness (e.g., colony-forming units per surface area).

- **Conduct program audits** - in environmental cleaning programs with functional routine monitoring programs, the CDC recommends the periodic performance of a comprehensive program audit to review the major program elements and

identify areas for improvement at the programmatic level. Health care professionals should note the following recommendations for program audits: program audits should review all of the key program elements; perform them annually or every two years; auditors should not be facility staff or at least should not be directly involved with the program implementation; options for auditors should be context-specific, but some potential options include auditors from an external company, health officers, or staff from another health care facility in the same network; file program audit reports and records on-site at the facility to allow benchmarking and to inform the development of remedial action plans and quality improvement projects.

Section 2 Summary

Adherence to environmental cleaning techniques and recommendations can optimize the effectiveness of environmental services. Health care administrators should ensure environmental services, within their health care organization, adheres to environmental cleaning techniques and recommendations, when applicable. Finally, health care administrators should work to integrate environmental cleaning techniques and recommendations into their health care organization's policies and procedures.

Section 2 Key Concepts

- Environmental cleaning techniques and recommendations can help ensure the effectiveness of environmental services.
- An environmental service manager is essential to safe and effective environmental cleaning; health care administrators/health care organizations should designate an environmental service manager.
- Health care administrators should develop and maintain environmental cleaning policies and procedures to help ensure the effectiveness of environmental services.

Section 2 Key Terms

Environmental cleaning - cleaning and disinfection (when needed, according to risk level) of environmental surfaces (e.g., bed rails, mattresses, call buttons, chairs) and surfaces of noncritical patient care equipment (e.g., IV poles, stethoscopes)

Cleaning logs - job aids that can help guide the daily workflow for cleaning staff and serve as cleaning records

Low-touch surfaces - surfaces that are minimally touched by health care workers and patients

High-touch surfaces - surfaces, often in patient care areas, that are frequently touched by health care workers and patients

Patient zone - the patient and his or her immediate surroundings, includes all surfaces that are temporarily and exclusively designated for that patient

Sluice room - a dedicated room or area, separated into dirty and clean areas, where noncritical patient care equipment is reprocessed

Performance observations - a method of assessing environmental cleaning procedures by an observer (e.g., cleaning supervisors) using standardized performance structured observations and checklists that are specific to individual patient care areas

Bioburden - the number of bacteria living on a surface that has not been sterilized

Visual assessment - an assessment that checks the cleanliness of an item or surface after the item/surface was cleaned

Fluorescent marker assessment - an assessment that uses a fluorescent marker (e.g., fluorescent material) to mark predetermined items and surfaces before cleaning

ATP bioluminescence assessment - an assessment characterized by the use of ATP to indicate the presence of organic material (microbial or biologic) on an object or surface

Environmental culture assessment - an assessment characterized by the process of taking cultures after an item is cleaned

Section 2 Personal Reflection Question

How can healthcare administrators ensure environmental cleaning techniques and recommendations are followed within their health care organization?

Section 3: Environmental Service Recommendations and Requirements

Finally, this section of the course will review specific environmental service recommendations and requirements provided by the CDC and the U.S. government. The information found within this section of the course was derived from materials provided by the CDC and the U.S. government unless, otherwise, specified (CDC, 2019; Code of Federal Regulations, 2022).

- Inform employees of the possible health effects of exposure to infectious agents (e.g., hepatitis B virus [HBV], hepatitis C virus, human immunodeficiency virus [HIV]), and/or chemicals (e.g., EtO, formaldehyde) (note: the information should be consistent with OSHA requirements and identify the areas and tasks in which potential exists for exposure).
- Educate employees in the selection and proper use of personal protective equipment (PPE).
- Ensure that employees wear appropriate PPE to preclude exposure to infectious agents or chemicals through the respiratory system, skin, or mucous membranes of the eyes, nose, or mouth. PPE can include gloves, gowns, masks, and eye protection. The exact type of PPE depends on the infectious or chemical agent and the anticipated duration of exposure. The employer is responsible for making such equipment and training available.
- Establish a program for monitoring occupational exposure to regulated chemicals (e.g., formaldehyde) that adheres to state and federal regulations.
- Exclude employees with weeping dermatitis of the hands from direct contact with patient-care equipment.
- Clean housekeeping surfaces (e.g., floors, tabletops) on a regular basis, when spills occur, and when these surfaces are visibly soiled.
- Disinfect (or clean) environmental surfaces on a regular basis (e.g., daily, three times per week) and when surfaces are visibly soiled.
- Follow manufacturers' instructions for proper use of disinfecting (or detergent) products, such as: recommended use-dilution, material compatibility, storage, shelf-life, and safe use and disposal.

- Clean walls, blinds, and window curtains in patient-care areas when these surfaces are visibly contaminated or soiled.
- Prepare disinfecting (or detergent) solutions as needed and replace these with fresh solutions frequently (e.g., replace floor mopping solution every three patient rooms, change mopping solution at 60-minute intervals), according to the health care facility's policy.
- Decontaminate mop heads and cleaning cloths regularly to prevent contamination (e.g., launder and dry at least daily).
- Use a one-step process and an EPA-registered hospital disinfectant designed for housekeeping purposes in patient care areas where uncertainty exists about the nature of the soil on the surfaces (e.g., blood or body fluid contamination versus routine dust or dirt); or uncertainty exists about the presence of multidrug resistant organisms on such surfaces.
- Detergent and water are adequate for cleaning surfaces in non-patient-care areas (e.g., administrative offices).
- Do not use high-level disinfectants/liquid chemical sterilants for disinfection of non-critical surfaces.
- Wet-dust horizontal surfaces regularly (e.g., daily, three times per week) using clean cloths moistened with an EPA-registered hospital disinfectant (or detergent) (note: individuals should prepare the disinfectant [or detergent] as recommended by the manufacturer).
- Disinfect noncritical surfaces with an EPA-registered hospital disinfectant according to the label's safety precautions and use directions (note: most EPA-registered hospital disinfectants have a label contact time of 10 minutes; however, many scientific studies demonstrated the efficacy of hospital disinfectants against pathogens with a contact time of at least one minute; by law, the user must follow all applicable label instructions on EPA-registered products; if the user selects exposure conditions that differ from those on the EPA-registered product label, the user assumes liability for any injuries resulting from off-label use and is potentially subject to enforcement action under law).
- Promptly clean and decontaminate spills of blood and other potentially infectious materials. Discard blood-contaminated items in compliance with federal regulations.

- For site decontamination of spills of blood or other potentially infectious materials (OPIM), individuals should use protective gloves and other PPE (e.g., when sharps are involved, individuals should use forceps to pick up sharps, and discard these items in a puncture-resistant container) appropriate for this task; and disinfect areas contaminated with blood spills using an EPA-registered tuberculocidal agent, a registered germicide on the EPA Lists D and E (i.e., products with specific label claims for HIV or HBV or freshly diluted hypochlorite solution).
- If individuals select sodium hypochlorite solutions they should use a 1:100 dilution (e.g., 1:100 dilution of a 5.25 - 6.15% sodium hypochlorite provides 525 - 615 ppm available chlorine) to decontaminate nonporous surfaces after a small spill (e.g., <10 mL) of either blood or OPIM. If a spill involves large amounts (e.g., >10 mL) of blood or OPIM, or involves a culture spill in the laboratory, individuals should use a 1:10 dilution for the first application of hypochlorite solution before cleaning in order to reduce the risk of infection during the cleaning process in the event of a sharp injury.
- If the spill contains large amounts of blood or body fluids, individuals should clean the visible matter with disposable absorbent material, and discard the contaminated materials in appropriate, labeled containment (note: individuals should use protective gloves and other PPE for the aforementioned task).
- Individuals should use an EPA-registered sporicidal disinfectant in units with high rates of endemic Clostridium difficile infection or in an outbreak setting.
- If chlorine solution is not prepared fresh daily, it can be stored at room temperature for up to 30 days in a capped, opaque plastic bottle with a 50% reduction in chlorine concentration after 30 days of storage (e.g., 1000 ppm chlorine [approximately a 1:50 dilution] at day 0 decreases to 500 ppm chlorine by day 30).
- An EPA-registered sodium hypochlorite product is preferred when cleaning and disinfecting environmental surfaces - however, if such products are not available, generic versions of sodium hypochlorite solutions (e.g., household chlorine bleach) may be used.
- Do not perform disinfectant fogging in patient-care areas (note: disinfectant fogging may refer to a chemical application method where very fine droplets of disinfectant are sprayed throughout a room or area in a fog or mist) (note: the

aforementioned recommendation refers to the spraying or fogging of chemicals [e.g., formaldehyde, phenol-based agents, or quaternary ammonium compounds] as a way to decontaminate environmental surfaces or disinfect the air in patient rooms).

- Institute the following control measures to reduce the occurrence of contaminated disinfectants: prepare the disinfectant correctly to achieve the manufacturer's recommended use-dilution; and prevent common sources of extrinsic contamination of germicides (e.g., container contamination or surface contamination of the healthcare environment where the germicide are prepared and/or used).
- Perform the cleaning, disinfection, and sterilization of patient-care devices in a central processing department in order to help control quality.
- Clean patient-care items with water and detergent, or with water and enzymatic cleaners before high-level disinfection or sterilization procedures.
- Remove visible organic residue (e.g., residue of blood and tissue) and inorganic salts with cleaning. Use cleaning agents that are capable of removing visible organic and inorganic residues.
- Clean medical devices as soon as practical after use (e.g., at the point of use) because soiled materials become dried onto the instruments (note: dried or baked materials on the instrument make the removal process more difficult and the disinfection or sterilization process less effective or ineffective).
- Perform either manual cleaning (i.e., using friction) or mechanical cleaning (e.g., with ultrasonic cleaners, washer-disinfector, washer-sterilizers), when applicable.
- If using an automatic washer/disinfector, ensure that the unit is used in accordance with the manufacturer's recommendations.
- Ensure that the detergents or enzymatic cleaners selected are compatible with the metals and other materials used in medical instruments. Ensure that the rinse step is adequate for removing cleaning residues to levels that will not interfere with subsequent disinfection/sterilization processes.
- Nontoxic products should be used for health care environmental cleaning. Nontoxic products should not be irritating to the skin or mucous membranes of the user, visitors, and patients.

- Health care administrators should select environmental cleaning products that do not have an offensive odor to patients.
- Environmental cleaning products should remove dirt, soil, and various organic substances; and should not cause environmental pollution upon disposal.
- Selected disinfectants should be broad spectrum (e.g., have a wide antimicrobial range, including those pathogens that are common causes of hospital-associated infections and/or outbreaks; fast acting; nonflammable - the product should not have a flash point of more than 65°C [150°F]).
- Develop and maintain a master list of facility-approved environmental cleaning products in the facility cleaning policy, as well as a list of approved suppliers (i.e., manufacturers, distributors).
- Minimize the number of different environmental cleaning products in use within the health care facility.
- Store environmental cleaning products in a manner that: eliminates contamination risk and degradation; minimizes contact with personnel (e.g., inhalation, skin contact).
- Manage environmental cleaning products according to the product's safety data sheet (SDS). Display the SDS where these products are stored and prepared.
- Prepare cleaning and disinfectant solutions according to the manufacturer's instructions (note: preparing higher-strength concentrations or diluting beyond recommendations may pose unnecessary risk to patients, staff, visitors, and the environment).
- Ensure that environmental cleaning products are selected that do not damage the surfaces and equipment to be cleaned and disinfected.
- Ensure that standard operating procedures or instructions are available for the preparation, use, and disposal of environmental cleaning products.
- Portable containers for environmental cleaning products (or solutions) should be clean, dry, appropriately-sized, labeled, and dated (note: narrow-necked bottles are preferred over buckets to prevent the "double-dipping" of cleaning cloths, which can contaminate solutions; squeeze bottles are preferred over spray bottles

for applying cleaning or disinfectant solutions directly to cleaning cloths before application to a surface).

- Surface cleaning cloths should be cotton or microfiber (note: disposable wipes can be used if resources allow). Health care facilities should have a supply of different colored cloths to allow color-coding (e.g., one color for cleaning and a second color for disinfecting) (note: color-coding can prevent cross-contamination between areas).
- Mop heads or floor cloths should be cotton or microfiber (note: microfiber cloths are often preferred over cotton for both cleaning cloths and mop heads because microfiber absorbs more dirt and microorganisms than cotton).
- Utilize cleaning carts and trolleys (note: cleaning carts and trolleys provide several benefits, such as the ability to carry and safely manage all the essential cleaning supplies and equipment and increased occupational safety for cleaning staff).
- Stock cleaning carts with sufficient quantities of supplies (e.g., cleaning cloths, cleaning solutions) to avoid the need to return for more supplies in the middle of cleaning in a particular patient care area (note: portable containers of environmental cleaning products [or solutions] and cleaning cloths can be carried directly on the cleaning cart or on a caddie kit, if a full cleaning cart is not available).
- Inspect equipment surfaces for breaks in integrity that would impair either cleaning or disinfection/sterilization. Discard or repair equipment that do not function as intended or cannot be properly cleaned, and disinfected or sterilized.
- Do not flash sterilize implanted surgical devices unless doing so is unavoidable.
- Do not use flash sterilization for convenience, as an alternative to purchasing additional instrument sets, or to save time.
- When using flash sterilization, make sure the following parameters are met: clean the item before placing it in the sterilizing container or tray; prevent exogenous contamination of the item during transport from the sterilizer to the patient; and monitor sterilizer function with mechanical, chemical, and biologic monitors.
- Do not use packaging materials and containers in flash sterilization cycles unless the sterilizer and the packaging material/container are designed for this use.

- When necessary, use flash sterilization for patient-care items that will be used immediately (e.g., to reprocess an inadvertently dropped instrument).
- When necessary, use flash sterilization for processing patient-care items that cannot be packaged, sterilized, and stored before use.
- Steam is the preferred method for sterilizing critical medical and surgical instruments that are not damaged by heat, steam, pressure, or moisture.
- Cool steam- or heat-sterilized items before they are handled or used in the operative setting.
- Follow the sterilization times, temperatures, and other operating parameters (e.g., gas concentration, humidity) recommended by the manufacturers of the instruments, the sterilizer, and the container or wrap used, and that are consistent with guidelines published by government agencies and professional organizations.
- Individuals should use low-temperature sterilization technologies (e.g., EtO, hydrogen peroxide gas plasma) for reprocessing critical patient-care equipment that is heat or moisture sensitive.
- Individuals should completely aerate medical items that were sterilized in the EtO sterilizer (e.g., polyvinyl chloride tubing requires 12 hours at 50°C, 8 hours at 60°C) before using these items in patient care.
- Sterilization using the peracetic acid immersion system can be used to sterilize heat-sensitive immersible medical and surgical items.
- Critical items that were sterilized by the peracetic acid immersion process must be used immediately (i.e., items are not completely protected from contamination, making long-term storage unacceptable).
- Dry-heat sterilization (e.g., 340°F for 60 minutes) can be used to sterilize items (e.g., powders, oils) that can sustain high temperatures.
- Comply with the sterilizer manufacturer's instructions regarding the sterilizer cycle parameters (e.g., time, temperature, concentration).
- Because narrow-lumen devices provide a challenge to all low-temperature sterilization technologies and direct contact is necessary for the sterilant to be

effective, ensure that the sterilant has direct contact with contaminated surfaces (e.g., scopes processed in peracetic acid must be connected to channel irrigators).

- Ensure that packaging materials are compatible with the sterilization process and have received FDA 510[k] clearance; ensure that packaging is sufficiently strong to resist punctures and tears to provide a barrier to microorganisms and moisture.
- Use mechanical, chemical, and biologic monitors to ensure the effectiveness of the sterilization process.
- Monitor each load with mechanical (e.g., time, temperature, pressure) and chemical (internal and external) indicators (note: if the internal chemical indicator is visible, an external indicator is not needed).
- Do not use processed items if the mechanical (e.g., time, temperature, pressure) or chemical (internal and/or external) indicators suggest inadequate processing.
- Use biologic indicators to monitor the effectiveness of sterilizers at least weekly with an FDA-cleared commercial preparation of spores (e.g., Geobacillus stearothermophilus for steam) intended specifically for the type and cycle parameters of the sterilizer.
- After a single positive biologic indicator used with a method other than steam sterilization, treat as nonsterile all items that have been processed in that sterilizer, dating from the sterilization cycle having the last negative biologic indicator to the next cycle showing satisfactory biologic indicator results (note: nonsterile items should be retrieved if possible and reprocessed).
- After a positive biologic indicator with steam sterilization, objects other than implantable objects do not need to be recalled because of a single positive spore test unless the sterilizer or the sterilization procedure is defective as determined by maintenance personnel or inappropriate cycle settings; if additional spore tests remain positive, consider the items nonsterile and recall and reprocess the items from the implicated load(s).
- Use biologic indicators for every load containing implantable items and quarantine items, whenever possible, until the biologic indicator is negative.
- Place items correctly and loosely into the basket, shelf, or cart of the sterilizer so as not to impede the penetration of the sterilant.

- Ensure the sterile storage area is a well-ventilated area that provides protection against dust, moisture, insects, and temperature and humidity extremes.
- Store sterile items so the packaging is not compromised (e.g., punctured, bent).
- Label sterilized items with a load number that indicates the sterilizer used, the cycle or load number, the date of sterilization, and, if applicable, the expiration date (note: the shelf life of a packaged sterile item depends on the quality of the wrapper, the storage conditions, the conditions during transport, the amount of handling, and other events (moisture) that compromise the integrity of the package; if event-related storage of sterile items is used, then packaged sterile items can be used indefinitely unless the packaging is compromised).
- Evaluate packages before use for loss of integrity (e.g., torn, wet, punctured) (note: the pack can be used unless the integrity of the packaging is compromised).
- If the integrity of the packaging is compromised (e.g., torn, wet, or punctured), repack and reprocess the pack before use.
- If time-related storage of sterile items is used, label the pack at the time of sterilization with an expiration date; once the date expires, reprocess the pack.
- Individuals should clean noncritical items that are shared between patients (e.g., crutches, blood pressure cuffs) in the home setting with a detergent or commercial household disinfectant.
- Monitor ventilation systems in accordance with engineers' and manufacturers' recommendations to ensure preventive engineering, optimal performance for removal of particulates, and elimination of excess moisture.
- Ensure that heating, ventilation, air conditioning (HVAC) filters are properly installed and maintained to prevent air leakages and dust overloads.
- Engineer humidity controls into the HVAC system and monitor the controls to ensure proper moisture removal.
- Incorporate steam humidifiers, if possible, to reduce potential for microbial proliferation within the system, and avoid use of cool mist humidifiers.
- Maintain air intakes and inspect filters periodically to ensure proper operation.

- Bag dust-filled filters immediately upon removal to prevent dispersion of dust and fungal spores during transport within the facility.
- Prevent dust accumulation by cleaning air-duct grilles in accordance with facility-specific procedures and schedules when rooms are not occupied by patients.
- Periodically measure output to monitor system function; clean ventilation ducts as part of routine HVAC maintenance to ensure optimum performance.
- Use portable, industrial-grade HEPA filter units capable of filtration rates in the range of 300 - 800 ft3/min. to augment removal of respirable particles as needed.
- Select portable HEPA filters that can recirculate all or nearly all of the room air and provide the equivalent of ≥12 ACH.
- Conduct an infection-control risk assessment (ICRA), when applicable.
- Keep emergency doors and exits from specific rooms closed except during an emergency; equip emergency doors and exits with alarms.
- Do not shut down HVAC systems in patient-care areas except for maintenance, repair, testing of emergency backup capacity, or new construction.
- Coordinate HVAC system maintenance with infection-control staff to allow for relocation of immunocompromised patients if necessary.
- For areas not served by installed emergency ventilation and backup systems, use portable units and monitor ventilation parameters and patients in those areas.
- Coordinate system startups with infection-control staff to protect patients from bursts of fungal spores.
- Establish a multidisciplinary team that includes infection-control staff to coordinate demolition, construction, and renovation projects and consider proactive preventive measures at the inception; produce and maintain summary statements of the team's activities.
- Incorporate mandatory adherence agreements for infection control into construction contracts, with penalties for noncompliance and mechanisms to ensure timely correction of problems.
- Establish and maintain surveillance for airborne environmental disease (e.g., aspergillosis) as appropriate during construction, renovation, repair, and

demolition activities to ensure the health and safety of immunocompromised patients.

- Implement infection-control measures relevant to construction, renovation, maintenance, demolition, and repair.
- Avoid damaging the underground water distribution system (i.e., buried pipes) to prevent soil and dust contamination of the water.
- Create and maintain negative air pressure in work zones adjacent to patient-care areas and ensure that required engineering controls are maintained.
- Seal windows in work zones if practical; use window chutes for disposal of large pieces of debris as needed, but ensure that the negative pressure differential for the area is maintained.
- Clean work zones and their entrances daily by wet-wiping tools and tool carts before their removal from the work zone; placing mats with tacky surfaces inside the entrance; and covering debris and securing this covering before removing debris from the work zone, when applicable.
- In patient-care areas, for major repairs that include removal of ceiling tiles and disruption of the space above the false ceiling, use plastic sheets or prefabricated plastic units to contain dust; use a negative pressure system within this enclosure to remove dust; and either pass air through an industrial grade, portable HEPA filter capable of filtration rates ranging from 300 - 800 ft3/min., or exhaust air directly to the outside.
- Use an EPA-registered anti-fungal biocide (e.g., copper-8-quinolinolate) for decontaminating structural materials.
- If air-supply systems to high-risk areas (e.g., PE rooms) are not optimal, use portable, industrial-grade HEPA filters on a temporary basis until rooms with optimal air-handling systems become available.
- Minimize exposures of severely immunocompromised patients (e.g., solid organ transplant patients or allogeneic neutropenic patients) to activities that might cause aerosolization of fungal spores (e.g., vacuuming or disruption of ceiling tiles).

- Locate air supply and exhaust grilles so that clean, filtered air enters from one side of the room, flows across the patient's bed, and exits from the opposite side of the room.
- Eliminate contaminated water or fluid environmental reservoirs (e.g., in equipment or solutions) wherever possible.
- Clean and disinfect sinks and washbasins on a regular basis by using an EPA-registered product as set by facility policies.
- Evaluate for possible environmental sources (e.g., potable water) of specimen contamination when waterborne microorganisms (e.g., NTM) of unlikely clinical importance are isolated from clinical cultures (e.g., specimens collected aseptically from sterile sites or, if post-procedural, colonization occurs after use of tap water in patient care).
- Maintain hot water temperature at the return at the highest temperature allowable by state regulations or codes, preferably ≥124°F (≥51°C), and maintain cold water temperature at <68°F (<20°C).
- Periodically increase the hot water temperature to ≥150°F (≥66°C) at the point of use.
- Maintain constant recirculation in hot-water distribution systems serving patient-care areas.
- Health care administrators should ensure that each employee receives training, in a language and at a literacy level the employee understands, and so that the employee comprehends at least the following: COVID-19, including how the disease is transmitted, the importance of hand hygiene to reduce the risk of spreading COVID-19 infections, ways to reduce the risk of spreading COVID-19 through the proper covering of the nose and mouth, the signs and symptoms of the disease, risk factors for severe illness, and when to seek medical attention; employer-specific policies and procedures on patient screening and management; tasks and situations in the workplace that could result in COVID-19 infection; workplace-specific policies and procedures to prevent the spread of COVID-19 that are applicable to the employee's duties (e.g., policies on Standard and Transmission-Based Precautions, physical distancing, physical barriers, ventilation, aerosol generating procedures); employer-specific multi-employer workplace agreements related to infection control policies and procedures, the use of

common areas, and the use of shared equipment that affect employees at the workplace; employer-specific policies and procedures for PPE, including: when PPE is required for protection against COVID-19; limitations of PPE for protection against COVID-19; how to properly put on, wear, and take off PPE; how to properly care for, store, clean, maintain, and dispose of PPE; and any modifications to donning, doffing, cleaning, storage, maintenance, and disposal procedures needed to address COVID-19 when PPE is worn to address workplace hazards other than COVID-19; workplace-specific policies and procedures for cleaning and disinfection; employer-specific policies and procedures on health screening and medical management; available sick leave policies, any COVID-19-related benefits to which the employee may be entitled under applicable federal, state, or local laws, and other supportive policies and practices (e.g., telework, flexible hours); the identity of the safety coordinator(s) specified in the COVID-19 plan; and how the employee can obtain copies of employer specific policies and procedures, including the employer's written COVID-19 plan, if required (Occupational Safety and Health Administration [OSHA], 2021).

- Health care administrators and organizations should provide comprehensive and intensive training for all staff assigned to reprocess semicritical and critical medical/surgical instruments to ensure they understand the importance of reprocessing these instruments.
- To achieve and maintain competency, train each member of the staff that reprocesses semicritical and/or critical instruments as follows: provide hands-on training according to the institutional policy for reprocessing critical and semicritical devices; supervise all work until competency is documented for each reprocessing task; conduct competency testing at beginning of employment and regularly thereafter (e.g., annually); and review the written reprocessing instructions regularly to ensure they comply with the scientific literature and the manufacturers' instructions.
- Health care administrators and relevant individuals should compare the reprocessing instructions provided by the instrument manufacturer and the sterilizer manufacturer and resolve any conflicting recommendations by communicating with both manufacturers.
- Health care administrators and relevant individuals should conduct infection control rounds periodically (e.g., annually) in high-risk reprocessing areas; ensure reprocessing instructions are current and accurate and are correctly

implemented; document all deviations from policy (note: stakeholders should identify what corrective actions will be implemented).

- Health care administrators should include the following in a quality control program for sterilized items: a sterilizer maintenance contract with records of service; a system of process monitoring; air-removal testing for prevacuum steam sterilizers; visual inspection of packaging materials; and traceability of load contents.
- For each sterilization cycle, record the type of sterilizer and cycle used; the load identification number; the load contents; the exposure parameters (e.g., time and temperature); the operator's name or initials; and the results of mechanical, chemical, and biological monitoring.
- Health care administrators should retain sterilization records for a time that complies with standards (e.g., three years), statutes of limitations, and state and federal regulations.
- Prepare and package items to be sterilized so that sterility can be achieved and maintained to the point of use. Consult the Association for the Advancement of Medical Instrumentation or the manufacturers of surgical instruments, sterilizers, and container systems for guidelines for the density of wrapped packages.
- Periodically review policies and procedures for sterilization.
- Perform preventive maintenance on sterilizers by qualified personnel who are guided by the manufacturer's instruction.
- Health care administrators should monitor possible sterilization failures that resulted in instrument recall.
- Health care administrators should develop a mechanism for the occupational health service to report all adverse health events potentially resulting from exposure to disinfectants and sterilants. Health care administrators should review such exposures; and implement engineering, work practice, and PPE to prevent future exposures.
- Health care administrators should assess whether additional training of personnel or equipment maintenance is required.

- Non-bulk packagings, large packagings, and non-specification bulk outer packagings used for the transportation of regulated medical waste or clinical waste or (bio) medical waste must be rigid containers (note: medical waste may refer to health care waste that contains or potentially contains infectious material).

- Non-bulk packagings for regulated medical waste or clinical waste or (bio) medical waste must be in standard packaging conforming to the requirements of; a non-bulk packaging used as a sharps container must be puncture-resistant for sharps and sharps with residual fluid; sharps containers must be securely closed to prevent leaks or punctures in conformance with the instructions provided by the packaging manufacturer (note: the term sharps container may refer to a container made from rigid puncture-resistant plastic or metal with leak-resistant sides and bottom, and a tight-fitting, puncture-resistant lid with an opening to accommodate depositing a sharp but not large enough for a hand to enter).

- Large packagings constructed, tested, and marked may be used for the transportation of regulated medical waste, provided the waste is contained in inner packagings; each large packaging design must be capable of meeting the related vibration tests.

- Each large packaging used to transport liquid regulated medical waste must contain absorbent material in sufficient quantity and appropriate location to absorb the entire amount of liquid present in the event of an unintentional release of contents. Each large packaging design intended for the transportation of sharps containers must be puncture resistant and capable of retaining liquids. The design must also be tested and certified as meeting the performance tests specified for intermediate bulk containers intended for the transportation of liquids (note: a wheeled cart (cart) or bulk outer packaging (BOP) is authorized as an outer packaging for the transportation of regulated medical waste).

- The following requirements apply to the transportation of regulated medical waste in carts or BOPs:

    - Regulated medical waste in each cart or BOP must be contained in non-bulk inner packagings;

    - Each cart or BOP must have smooth, non-porous interior surfaces free of cracks, crevices, and other defects that could damage plastic film inner packagings or impede disinfection operations;

    - Each cart or BOP must be used exclusively for the transportation of regulated medical waste;
    - Prior to reuse, each cart or BOP must be disinfected by any means effective for neutralizing the infectious substance the packaging previously contained;
    - Untreated concentrated stock cultures of infectious substances containing Category A materials may not be transported in a cart or BOP; division 6.1 toxic waste or Class 7 radioactive waste, with the exception of chemotherapeutic waste, may not be transported in a cart or BOP; division 6.1 or Class 7 chemotherapeutic waste; untreated concentrated stock cultures of infectious substances containing Category B infectious substances;
    - Unabsorbed liquids; and sharps containers may be transported in a cart or BOP only if packaged in rigid non-bulk packaging.
- A cart is authorized as an outer packaging for the transportation of regulated medical waste if it conforms to the following requirements:
    - Each cart must consist of a solid, one-piece body with a nominal volume not exceeding 1,655 L (437 gallons);
    - Each cart must be constructed of metal, rigid plastic, or fiberglass fitted with a lid to prevent leakage during transport;
    - Each cart must be capable of meeting the related requirements (drop test) at the Packing Group II performance level;
    - Inner packagings must be placed into a cart and restrained in such a manner as to minimize the risk of breakage.
- Inner packagings must be durably marked or tagged with the name and location (city and state) of the offeror, except when the entire contents of the large packaging, cart, or BOP originates at a single location and is delivered to a single location.
- A plastic film bag is authorized as an inner packaging for solid regulated medical waste transported in a cart, large packaging, or BOP. Waste material containing

absorbed liquid may be packaged as a solid in a plastic film bag if the bag contains sufficient absorbent material to absorb and retain all liquid during transportation.

- The film bag may not exceed a volume of 175 L (46 gallons); the film bag must be marked and certified by its manufacturer as having passed the tests prescribed for tear resistance; the film bag must meet an impact resistance of 165 grams and a tearing resistance of 480 grams in both the parallel and perpendicular planes with respect to the length of the bag.
- The plastic film bag must be closed with a minimum of entrapped air to prevent leakage in transportation; the bag must be capable of being held in an inverted position with the closed end at the bottom for a period of five minutes without leakage.
- Liquid regulated medical waste or clinical waste or (bio) medical waste transported in a large packaging, cart, or BOP must be packaged in a rigid inner packaging (note: liquid materials are not authorized for transportation in inner packagings having a capacity greater than 19 L [5 gallons]).
- Sharps transported in a large packaging, cart, or BOP must be packaged in a puncture-resistant, non-bulk inner packaging (sharps container).
- Each sharps container must be securely closed to prevent leaks or punctures in conformance with instructions provided by the packaging manufacturer.
- Each sharps container exceeding 76 L (20 gallons) in volume must be capable of passing related performance tests.
- A sharps container may be reused only if it conforms to the following criteria:
    - The sharps container is specifically approved and certified by the FDA as a medical device for reuse;
    - The sharps container must be permanently marked for reuse;
    - The sharps container must be disinfected prior to reuse by any means effective for the infectious substance the container previously contained;
    - The sharps container must have a capacity greater than 7.57 L (2 gallons) and not greater than 151.42 L (40 gallons) in volume.

Section 3 Summary

Health care administrators should be aware of specific environmental service recommendations and requirements provided by the CDC and the U.S. government. Such recommendations and requirements should be integrated into a health care organization's policies and procedures. Health care organizations should work to revise organizational policies and procedures, as needed, to include updated environmental service recommendations and requirements.

Section 3 Key Concepts

- Health care administrators should be aware of specific environmental service recommendations and requirements provided by the CDC and the U.S. government.

Section 3 Key Terms

Disinfectant fogging - a chemical application method where very fine droplets of disinfectant are sprayed throughout a room or area in a fog or mist

Medical waste - health care waste that contains or potentially contains infectious material

Sharps container - a container made from rigid puncture-resistant plastic or metal with leak-resistant sides and bottom, and a tight-fitting, puncture-resistant lid with an opening to accommodate depositing a sharp but not large enough for a hand to enter

Section 3 Personal Reflection Question

How can healthcare administrators ensure that environmental services recommendations and requirements provided by the CDC and the U.S. government are followed within their health care organization?

Conclusion

Environmental services are essential to the day-to-day operation of a healthcare facility. One of the main roles of environmental services is to prevent the transmission of

infectious diseases through cleaning, decontamination, disinfection, and sterilization. Health care administrators should work to integrate environmental services recommendations into their health care organization's policies and procedures to optimize results.

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